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10/511,562	10/15/2004	Aaron Reel Bouillett	PU020123	4174

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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,562	BOUILLETT, AARON REEL	
	Examiner	Art Unit	
	Leon-Viet Q. Nguyen	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 24-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 24-26* is/are rejected.

7)☒ Claim(s) *26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to communication filed on 8/27/07. Claims 1-18 and 24-26 are pending on this application.

1. Applicant's arguments overcome the following objection/rejection:

   a. Rejection of claims 25 and 26 under 35 USC 112, first paragraph

   b. Rejection of claims 1-18 and 24 under 35 USC 103(a)

2. Applicant's arguments, see Appeal Brief, filed 8/27/07, with respect to the rejection(s) of claims 1-18 and 24 under 35 USC 103(a) and claims 25-26 under 35 USC 112 first paragraph have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ogawa et al (US5781463), Nam (US6515713), Nozue (US4697265), and Strolle et al (US5835532).

Response To Remarks

Regarding claim 1, in response to part I of Examiner's argument, applicant asserts that Ogawa does not teach a monitoring circuit which must receive and apply a test criterion to a decision device output signal containing permissible symbol values of a symbol constellation (Appeal Brief page 12 first paragraph). Applicant furthermore asserts that Ogawa counts the size of the error (Appeal Brief page 12 first paragraph).

Examiner respectfully disagrees.

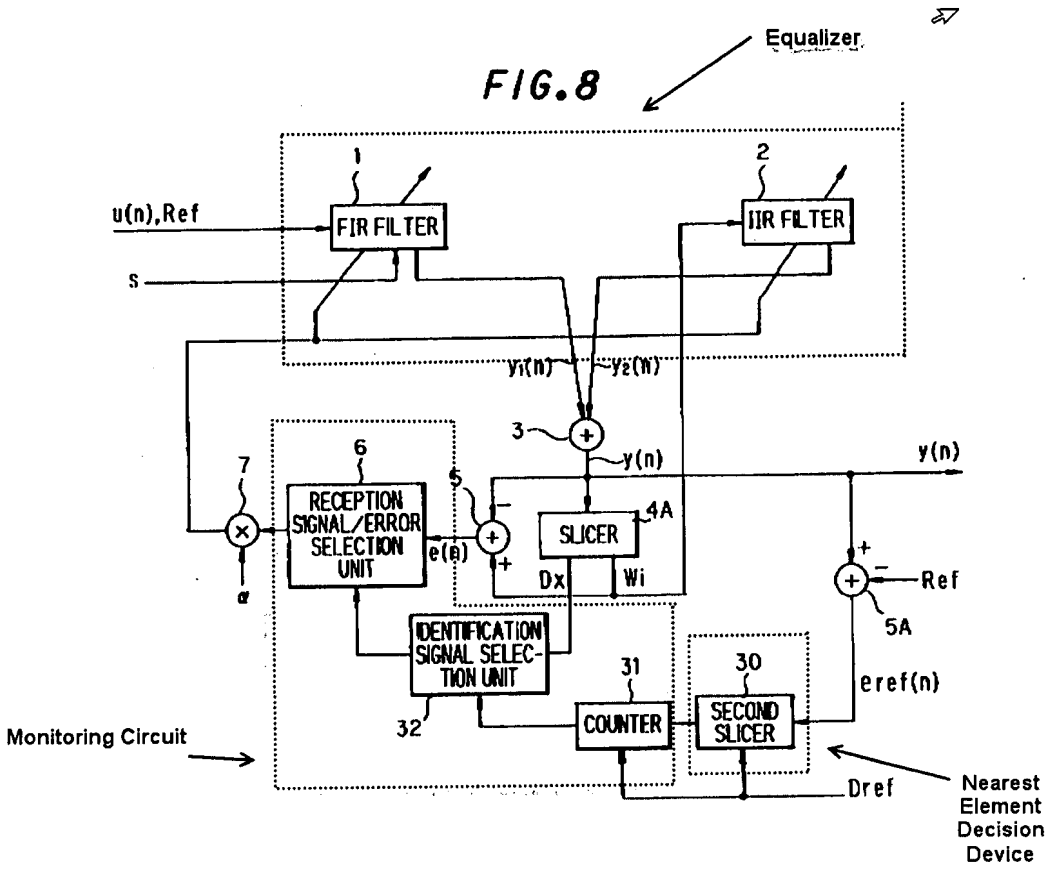
Nowhere in claim 1 does the monitoring circuit receive a test criterion. The monitoring circuit receives a decision device output signal and applies a test criterion to the data contained in that signal (Appeal Brief page 16 claim 1). They are clearly two different things. Moreover, counter 31 in fig. 8 of Ogawa determines which of logic signals "1" and "0" is to be counted in the next count operation (col. 16 lines 54-57 of Ogawa). One of ordinary skill in the art would have realized that to determine which signal would be counted in the next operation, some sort of test or comparison would be necessary.

Further regarding claim 1, in response to part I of Examiner's argument, applicant asserts that Ogawa does not describe or suggest a monitoring circuit (Appeal Brief page 12 second paragraph). Applicant asserts that element 6 and element 5 do not suggest a monitoring circuit and that element 6 does not apply a test criterion (Appeal Brief page 12 second paragraph).

Examiner respectfully disagrees.

In the previous office action dated April 20, 2007, examiner interpreted elements 6, 31, and 32 of fig. 8 as the monitoring circuit (see page 3 of the previous office action dated 4/20/07). Element 5 was not considered to be part of the monitoring circuit, as seen below. Furthermore, as stated above, counter 31 performs a test to determine which signal is to be counted in the next operation. Counter 31 in fig. 8 of Ogawa is considered to be part of the monitoring circuit as seen below.

FIG. 8



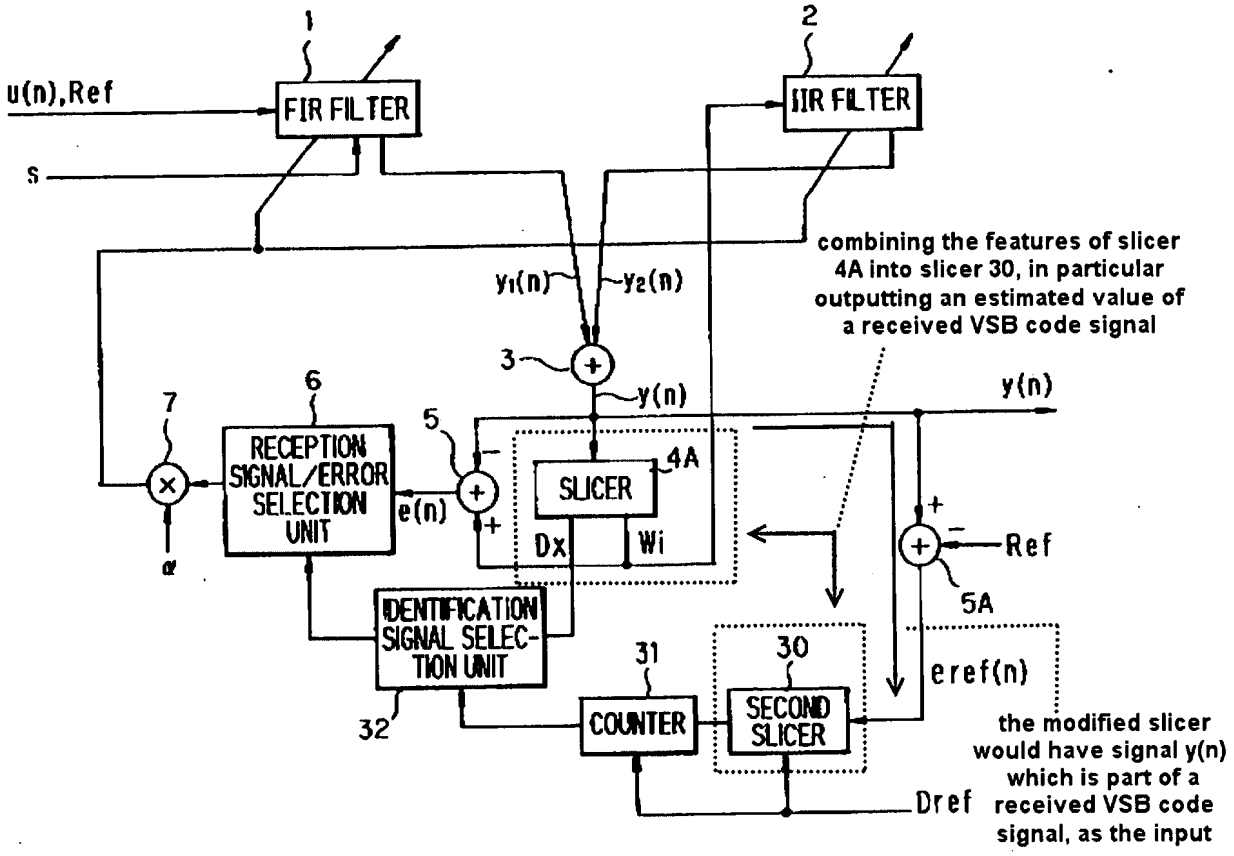
Regarding claim 1, in response to part II of Examiner's argument, applicant asserts that the embodiment shown in fig. 8 of Ogawa already includes the embodiment shown in fig. 3 (Appeal Brief page 12 last paragraph) and that combining the embodiments of fig. 3 and fig. 8 of Ogawa does nothing (Appeal Brief page 13 first paragraph).

Examiner agrees that the embodiment in fig. 8 includes the embodiment shown in fig. 3. However it is noted in the previous office action that the embodiment in fig. 8 fails to teach where the nearest decision device element creates a decision device output signal containing permissible symbol values of a symbol constellation (previous office action page 3). Slicer 4A in fig. 3 is interpreted to perform this function (see the new grounds of rejection to claim 1).

Also regarding claim 1 in response to part II of Examiner's argument, applicant asserts that replacing slicer 30 in fig. 8 of Ogawa with slicer 4A in fig. 3 of Ogawa is wrong (Appeal Brief page 13 second paragraph). Applicant further asserts that a training symbol is used in the embodiment shown in fig. 8 of Ogawa and that there is no reason to replace the second slicer 30 with silcer 4A in fig. 8 of Ogawa (Appeal Brief page 13 last paragraph).

Examiner agrees. However the argument is moot in view of the new grounds of rejection. Slicer 4A does not replace second slicer 30 in fig. 8 of Ogawa, but rather the features of Slicer 4A are combined with slicer 30 in fig. 8 of Ogawa (see the new grounds of rejection to claim 1 below as well as fig. 8 on the following page).

FIG.8



Also regarding claim 1 in response to part II of Examiner's argument, applicant asserts that the arrangement shown in fig. 8 of Ogawa does not show or suggest testing the sliced symbols as claimed in claim 1 but rather counts the types of errors (Appeal Brief page 14 first paragraph).

Examiner respectfully disagrees.

As previously stated above, counter 31 in fig. 8 of Ogawa is interpreted to be part of a monitoring circuit. Furthermore, one of ordinary skill in the art would have realized that to determine which signal would be counted in the next operation (col. 16 lines 54-58 of Ogawa), some sort of test or comparison would be necessary. It is also noted that nowhere in claim 1 does it recite testing of sliced symbols.

Further regarding claim 1 in response to part II of Examiner's argument, applicant asserts that examiner's motivation for modifying fig. 8 of Ogawa is irrelevant and wrong given the use of a training signal (Appeal Brief page 14 second paragraph).

Examiner respectfully disagrees.

The fact that a training symbol is used does not change the function of slicer 30 in fig. 8 of Ogawa. It is well known in the art that training sequences are used in VSB modulated signals for synchronization. Applicant's invention also uses VSB signals (page 7 lines 12-14 of applicant's specification) so applicant's receiver already knows what symbols were transmitted. Therefore the motivation cited on page 4 of the previous office action is valid.

Regarding the arguments to claims 2-18 and 24, the issues have been addressed in the response to applicant's arguments of claim 1 above.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 26 recites the limitation "wherein M equals N". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7, 10-12, 15-18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al (US5781463).

Re claim 1, Ogawa teaches an apparatus for determining convergence of an equalizer, comprising:

an equalizer output signal (the output from 1 and 2); and

a monitoring circuit (6, 31, and 32 in fig. 8), the monitoring circuit receiving an output signal (fig. 8, the output of 30) and applying a test criterion to data contained in the decision device output signal so as to determine equalizer convergence (col. 16 lines 54-57, one of ordinary skill in the art would have realized that to determine which

signal would be counted in the next operation, some sort of test or comparison would be necessary).

In the current embodiment, Ogawa fails to teach teaches a nearest element decision device, the nearest element decision device receiving the equalizer output signal and creating a decision device output signal containing permissible symbol values of a symbol constellation used in transmission of a signal to the apparatus

However, in a different embodiment, Ogawa teaches a nearest element decision device (4A in fig. 3), the nearest element decision device receiving the equalizer output signal (y(n) in fig. 3) and creating a decision device output signal containing permissible symbol values of a symbol constellation used in transmission of a signal to the apparatus (col. 10 lines 40-43, col. 11 lines 1-5 and 25-31, the estimated value w(n) is one of the central values of the numerical regions G_1 to G_8 which is part of an 8 VSB code signal).

Therefore, taking the combined embodiments as taught by Ogawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of the decision device of the second embodiment into the decision device within the apparatus of the first embodiment. The motivation to combine the two embodiments would be to discriminate to which one of a numerical region that is defined to have a normal code value free from any modulation due to disturbance as a central value (col. 10 lines 42-46).

Re claim 2, the modified invention of Ogawa teaches an apparatus wherein the equalizer is formed to include an infinite impulse response filter (2 in fig. 8).

Re claim 3, the modified invention of Ogawa teaches an apparatus wherein the nearest element decision device is a slicer (4A in fig. 3).

Re claim 4, the modified invention of Ogawa teaches an apparatus wherein the monitoring circuit receives the decision device output signal for a predetermined period of time (col. 7 lines 6-11, the selection unit 6 in fig. 8 is part of the monitoring circuit) representing an acquisition of a desired number of transmitted symbol values (col. 16 lines 52-54, the logic signal from 30 in fig. 8 containing "0" and "1").

Re claim 5, the modified invention of Ogawa teaches an apparatus further comprising a memory (fig. 5), the memory being coupled to the monitoring circuit and being adapted to store decision device output data and test criteria (col. 14 lines 17-20).

Re claim 6, the modified invention of Ogawa teaches an apparatus wherein the test criteria for determining equalizer convergence includes identifying a desired sample of transmitted symbol values (col. 16 lines 58-63).

Re claim 7, the modified invention of Ogawa teaches an apparatus wherein the desired sample of transmitted symbol values includes at least one of every possible

symbol value (col. 16 lines 52-54, the logic signal contains the only two possible values "0" and "1").

Re claim 10, the modified invention of Ogawa teaches an apparatus wherein the equalizer output signal includes an image representative datastream containing data packets (col. 4 lines 43-46, the apparatus being a television receiver obtaining a reception image and it is well known in the art that image data can be sent in packets).

Re claim 11, the modified invention of Ogawa teaches an apparatus wherein the monitoring circuit is a microprocessor (31 in fig. 8, it is well known in the art that a counter is a microprocessor).

Re claim 12, Ogawa teaches an equalizer status monitoring device for use in a digital communication system (fig. 8), the device including an adaptive channel equalizer (1 and 2 in fig. 8), a slicer (4A in fig. 8) and a monitoring circuit (6, 31, and 32 in fig. 8), wherein the digital communications system receives a vestigial sideband modulated signal containing high definition video information (col. 4 lines 43-46, the system being a television receiver obtaining a reception image) represented by a multiple level symbol constellation (figs. 2A-2C), the data having a data frame format constituted by a succession of data frames (it is necessary that a television receiver receive data images in succession), the adaptive channel equalizer generating a first output signal which is input to the slicer (the output from 1 and 2 in fig. 8), the slicer

generating a second output signal which is input to the monitoring circuit (the output of slicer 4A into component 32 in fig. 8); the monitoring circuit applying a test criteria to the second output signal to determine convergence of the adaptive channel equalizer (col. 16 lines 54-57, one of ordinary skill in the art would have realized that to determine which signal would be counted in the next operation, some sort of test or comparison would be necessary).

In the current embodiment, Ogawa fails to teach wherein the second output signal containing permissible symbol values of a symbol constellation used in transmission of a signal in the digital communication system. However, in a different embodiment, Ogawa teaches creating an output signal containing permissible symbol values of a symbol constellation used in transmission of a signal to the apparatus (col. 10 lines 40-43, col. 11 lines 1-5 and 25-31, the estimated value w(n) is one of the central values of the numerical regions G_1 to G_8 which is part of an 8 VSB code signal).

Therefore, taking the combined embodiments as taught by Ogawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of the decision device of the second embodiment into the decision device within the apparatus of the first embodiment. The motivation to combine the two embodiments would be to discriminate to which one of a numerical region that is defined to have a normal code value free from any modulation due to disturbance as a central value (col. 10 lines 42-46).

Re claims 15 and 17, the modified invention of Ogawa teaches a system wherein the test criteria for determining convergence requires identifying at least some transmitted symbol values (col. 16 lines 58-63).

Re claim 16, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 2.

Re claim 18, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 11.

Re claim 24, Ogawa teaches a method for use in determining equalizer convergence, the method comprising the steps of:

slicing an equalizer output signal (the output $y_2(n)$ of IIR filter 2 is sliced in slicer 4A in fig. 3) to provide a sequence of symbols (col. 11 lines 62-67), each symbol taken from a constellation of possible transmitted symbols (col. 13 lines 5-14).

Ogawa fails to teach testing at least a plurality of symbols of the sequence to determine if the equalizer is converged or not. However in a different embodiment, Ogawa teaches testing at a training sequence (col. 16 lines 42-50), which is part of a received code sequence (col. 16 lines 18-20), to determine if the equalizer is converged or not (col. 16 lines 58-63).

Therefore, taking the combined embodiments as taught by Ogawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was

made to incorporate testing method of the second embodiment into the method of determining convergence of the first embodiment. The motivation to combine the two embodiments would be to shorten the convergence time (col. 17 lines 60-62).

3. Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al (US5781463) in view of Nam (US6515713).

Re claim 8, Ogawa teaches an apparatus wherein the monitoring circuit is coupled to the equalizer (the output of 6 to 1 and 2), but fails to teach the monitoring circuit resetting the equalizer when the equalizer diverges. However Nam teaches resetting an equalizer when the equalizer is diverged (col. 2 lines 14-18).

Therefore taking the combined teachings of Ogawa and Nam as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of resetting an equalizer of Nam into the receiver of Ogawa to compensate for channel distortion and perform stable equalization (col. 2 lines 14-18).

Re claim 13, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 8.

4. Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al (US5781463) in view of Nozue (US4697265).

Re claim 9, Ogawa teaches an apparatus wherein the monitoring circuit is coupled to the equalizer (the output of 6 to 1 and 2), but fails to teach the monitoring circuit resetting the equalizer when the equalizer achieves an invalid state. However Nozue teaches resetting an equalizer if the error rate for some received data becomes too high and exceeds a specific value (col. 1 lines 29-34).

Therefore taking the combined teachings of Ogawa and Nozue as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of resetting an equalizer of Nozue into the receiver of Ogawa to prevent divergence of the equalizer (col. 1 line 34).

Re claim 14, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 9.

5. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al (US5781463) in view of Strolle et al (US5835532).

Re claim 25, Ogawa fails to teach a method wherein the constellation comprises an alphabet of N symbols, where N > 1, and the testing step determines that the equalizer is converged if at least M of the N symbols of the alphabet are represented in the plurality of symbols, where M > 1.

However Strolle teaches wherein the constellation comprises an alphabet of N symbols, where N > 1, (col. 6 lines 31-47) and the testing step determines that the

equalizer is converged if at least M of the N symbols of the alphabet are represented in the plurality of symbols, where M > 1 (fig. 4, col. 8 lines 41-43, covering the full 8-VSB constellation means each of the 8 symbols of the constellation is represented).

Therefore taking the combined teachings of Ogawa and Strolle as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of Strolle into the method of Ogawa. The motivation to combine Strolle and Ogawa would be to provide finer resolution (col. 3 lines 7-10).

Re claim 26, Ogawa fails to teach a method wherein M equals N. However Strolle teaches where M equals N (fig. 4, the third clusters and the respective decision device outputs).

Therefore taking the combined teachings of Ogawa and Strolle as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of Strolle into the method of Ogawa. The motivation to combine Strolle and Ogawa would be to provide finer resolution (col. 3 lines 7-10).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon-Viet Q. Nguyen whose telephone number is 571-270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Nguyen/
Assistant Examiner Art Unit 2611

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